Missouri Juvenile Risk Assessment Re-Validation Report [III]

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June 2011

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I.   INTRODUCTION

This report presents the results of a study to assess the classification accuracy of the *Missouri Juvenile Offender Risk Assessment* using a state level definition of recidivism as the dependent variable. An additional goal of the study was to test the accuracy of the risk assessment for use with minority and gender subgroups as it has been suggested risk factors associated with recidivism for subgroups may vary.

II.   BACKGROUND & METHOD

The *Missouri Juvenile Offender Risk Assessment* is an empirically developed risk assessment that has helped Missouri juvenile divisions promote public safety and ensure disposition equity since 1999. A commitment to periodic revalidation of the *Missouri Juvenile Offender Risk Assessment* helps to ensure lasting stakeholder support for this objective decision-making approach to public safety and disposition equity. To determine the classification accuracy of the Missouri Juvenile Offender Risk Assessment, the Office of State Courts Administrator (OSCA), Division of Court Programs, Research and Education (CPR&E):

1. Examined how well the current risk assessment classifies youth into low, moderate, and high risk groups by observing recidivism, as measured by Missouri's standardized definition[1]; and

2. Analyzed the available data to determine if alterations to the current risk assessment could improve its performance, particularly for subgroups.

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[1] A juvenile offender recidivist is any youth, referred to the juvenile office for a legally sufficient law violation during a calendar year, who receives one or more legally sufficient law violation(s) to the juvenile or adult court within one year of the initial referral's disposition date.

III.   FINDINGS

An effective and valid risk assessment has progressively higher recidivism rates that correspond to each increase in risk classification level across multiple outcomes. Ideally, the rates between consecutive risk levels maximize the separation between the high and low risk groups, as well as between consecutive risk groups. The best way to assess the performance of the risk assessment versions, then, is to compare the separation between risk levels between the low and high risk groups; and between consecutive groups. These comparisons were made for the total group of youth as well as subgroups defined by youths' ethnicity, gender, and geographic location for four risk assessment versions:

1. The current risk assessment
2. The current risk assessment with revised cut points
3. The current risk assessment with re-weighted items
4. The re-developed risk assessment

As expected, each of these risk assessment versions resulted in slightly different risk level distributions (Table E1). The current risk assessment classified 23.5% of youth as low risk, 61.2% as moderate risk and 15.3% as high risk. In comparison, the other risk assessment versions classified a smaller proportion of the youth as moderate and high risk. The current risk assessment with revised cut points classified 52.1% of youth as moderate risk and 15.3% as high risk. The current risk assessment with revised cut points and re-weighted items classified 62.8% of youth as moderate risk and 14.1% as high risk. The re-developed assessment classified 59.5% of the youth as moderate risk and 11.9% as high risk, the smallest proportion of high risk youth of all versions.

Table E1: Risk Level Distribution by Risk Assessment Version

	Low Risk		Moderate Risk		High Risk		Total	
	N	%	N	%	N	%	N	%
1. Current Risk Assessment	3333	**23.5%**	8686	**61.2%**	2167	**15.3%**	14186	**100.0%**
2. Current Risk Assessment with Revised Cut Points	4622	**32.6%**	7397	**52.1%**	2167	**15.3%**	14186	**100.0%**
3. Current Risk Assessment with Re-Weighted Items[2]	4969	**35.0%**	7216	**50.9%**	2001	**14.1%**	14186	**100.0%**
4. Re-Developed Risk Assessment	4056	**28.6%**	8443	**59.5%**	1687	**11.9%**	14186	**100.0%**

Table E2 presents findings for the subsequent sufficient law referral outcome variable by risk assessment version. When the current risk assessment is applied, 8.6% of youth classified low risk, 31.5% of youth classified moderate, and 53.7% of youth classified high risk had received a subsequent sufficient referral. The re-referral rate for high risk youth was **5.2** times greater than the rate for low risk youth[3].

The re-referral rate among youth classified at each risk level differed when the other versions of the risk assessment were applied. Applying the current risk assessment with revised cut points, high risk youth had re-referral rate that was **4.3** times that of low risk youth. When applying the current risk assessment with revised cut points and re-weighted items high risk youth were re-referred **4.7** times more often than low risk youth. Youth classified high risk by the re-developed tool had a re-referral rate **7.4** times greater than low risk youth.

Comparison of re-referral rates for moderate and high risk youth again show the current and redeveloped assessments outperformed the remaining versions. Using the current instrument, high risk youth had a re-referral rate **.70** times greater than the rate for moderate risk youth. For the redeveloped version, high risk youth were re-referred at a rate **.65** times greater than that for moderate risk youth. High risk youth identified by the remaining versions were less than **.60** times more likely to be re-referred when compared with their moderate risk counterparts.

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[2] This version also has, by necessity, revised cut points. For ease of reference, however, future tables will use the label 'the Current Risk Assessment with Re-Weighted Items.'

3 This comparison (a percentage increase) is calculated by dividing the difference in rates by the lower rate. For example, the (high risk rate – low risk rate) is divided by the low risk rate. The purpose of this comparison is to enable comparisons of differences, while controlling for the lower rate. For example, the difference between low-moderate risk and moderate-high risk might both be 10%, but the percentage increase would be very different.

Table E2: Findings for Subsequent Sufficient Law Referral by Risk Assessment Version

	Total N	Subsequent Sufficient Law Referral	
		N	%
Total Sample	14186	4182	**29.5%**
1. Current Risk Assessment			
Low Risk	3333	287	**8.6%**
Moderate Risk	8686	2732	**31.5%**
High Risk	2167	1163	**53.7%**
2. Current Risk Assessment with Revised Cut Points			
Low Risk	4622	471	**10.2%**
Moderate Risk	7397	2548	**34.4%**
High Risk	2167	1163	**53.7%**
3. Current Risk Assessment with Re-Weighted Items			
Low Risk	4969	484	**9.7%**
Moderate Risk	7216	2596	**36.0%**
High Risk	2001	1102	**55.1%**
4. Re-Developed Risk Assessment			
Low Risk	4056	274	**6.8%**
Moderate Risk	8443	2939	**34.8%**
High Risk	1687	969	**57.4%**

Table E3 presents findings for the four assessment versions by outcome measure. Regardless of outcome measure, the current assessment performed well in distinguishing between the low and high risk groups; and consecutive groups. In fact, only the redeveloped assessment version outperformed the current assessment overall, and when subsequent sufficient law referral is the outcome measure, the percentage increase in re-referral rate for moderate to high risk youth is actually greater for the current version (65% vs. 71%, respectively). The re-weighted version marginally outperformed the revised version, but these versions did redistribute the absolute number of youth in each risk category more uniformly than the current and redeveloped versions.

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Risk Assessment Version	Subsequent Sufficient Law Referral Outcome			Subsequent Sufficient Class A Misdemeanor or Felony Outcome			Subsequent Sufficient Felony Referral Outcome		
Table E3 **Percentage Increase in Rates between Risk Levels** **by Risk Assessment Version**									
	From Low to Mod	From Mod to High	From Low to High	From Low to Mod	From Mod to High	From Low to High	From Low to Mod	From Mod to High	From Low to High
1. Current Risk Assessment	266%	71%	524%	283%	63%	525%	340%	129%	906%
2. Current Risk Assessment with Revised Cut Points	237%	56%	426%	254%	49%	426%	260%	110%	655%
3. Current Risk Assessment with Re-Weighted Items	271%	53%	468%	282%	48%	464%	322%	105%	767%
4. Re-Developed Risk Assessment	411%	65%	744%	455%	71%	850%	517%	128%	1308%

SUMMARY

Summarizing the performance of risk assessment versions compare overall and for subgroups based on gender, ethnicity and location:

The current and redeveloped risk assessment versions both distinguished well between low and high risk youth, outperforming both the revised and re-weighted assessment versions in this respect. Comparison of the current and redeveloped versions assessing distinction between moderate and high risk youth show mixed results, with the current assessment outperforming the redeveloped version when the primary outcome measure [subsequent sufficient law referral] is applied. Conversely, the redeveloped version outperformed the current version when the outcome measure is a subsequent sufficient Class A misdemeanor, or felony. These versions functioned similarly when the outcome measure was subsequent sufficient felony, although the redeveloped version classified proportionately fewer youth as high risk and more evenly distributed moderate and low risk youth.

Results for the revised and re-weighted version of the assessment were mixed. While the re-weighted version outperformed the revised version in distinguishing between low and high risk youth regardless of outcome measure, the revised version was better at distinguishing between moderate and high risk youth.

Results for subgroups show:

- o The re-developed risk assessment version produced the most similar re-referral rates across gender and the greatest distinction between low and high risk categories when compared with the revised and re-weighted versions, regardless of the outcome measure applied. The current and redeveloped versions performed similarly in distinguishing between moderate and high risk categories.

- o The current and revised risk assessment versions produced the most similar re-referral rates across ethnicity. However, the re-developed risk assessment version produced the greatest distinction between low and high risk categories compared with the revised and re-weighted versions, regardless of the outcome measure applied. The current version slightly outperformed the redeveloped in distinguishing between moderate and high risk categories.

- o Comparing risk assessment performance for subsequent sufficient law referrals, the redeveloped version produced the most similar re-referral rates across location, followed by the re-weighted version.

- o The redeveloped risk assessment produced the greatest distinction between low and high risk categories by location. However, the current risk assessment version outperformed the redeveloped one when moderate and high risk urban youth were compared. Similar comparisons show that high risk rural youth were equally likely than moderate risk rural youth to be re-referred when either the current or redeveloped assessment version was applied.

Results of the study show the redeveloped risk assessment attained the best separation between risk levels overall, followed closely by the current version. For subgroups, the two versions performed similarly. However, a recommendation regarding which risk assessment to adopt should be based on policy implications as well as research findings. Policy issues associated with modification of the current risk assessment version include an understanding that:

o   Changes would result in corresponding modifications to the JIS CZAASMT and training materials;

o   Changes would require training officers and on the assessment version selected;

o   Changes to the assessment version could influence face validity of the assessment, making officers less confident it accurately classifies youth, although eliminating "weak" risk factors may also improve reliability due to the difficulties obtaining information related to variables such as history of child abuse and neglect and parental incarceration history;

o   Changes to the assessment version could impact juvenile officer workload due to the proportion of youth assigned to each risk level category;

o   Eliminating static factors such as history of child abuse and neglect and parental incarceration history could potentially impact the outcomes for risk reassessment;

I.   INTRODUCTION

This report presents the results of a study to assess the classification accuracy of the *Missouri Juvenile Offender Risk Assessment* using a state level definition of recidivism as the dependent variable. An additional goal of the study was to test the accuracy of the risk assessment for use with minority and gender subgroups as it has been suggested risk factors associated with recidivism for subgroups may vary.

IV.   BACKGROUND

Risk assessment in juvenile justice refers to a process of classifying juvenile offenders based on their relative likelihood to re-offend. While assessments historically involved subjective criteria and discretionary procedures, modern risk assessments are comprised of objective criteria [risk factors] and developed using empirical methodology to evaluate properties of reliability and validity. The *Missouri Juvenile Offender Risk Assessment* is an empirically developed risk assessment that has helped Missouri juvenile divisions promote public safety and ensure disposition equity since 1999.

As juvenile offender populations and factors associated with the risk of re-offending can change over time, risk assessments require periodic revalidation to remain valid for their intended purpose. Risk assessment revalidation is recommended every two to five years. The *Missouri Juvenile Offender Risk Assessment*, twice validated [1998 & 2002], was last validated nine years ago by the National Council on Crime and Delinquency (NCCD). Results of the NCCD revalidation showed that Missouri's risk assessment conformed with their standards of validity pertaining to progression, separation and distinction among risk levels and recidivism. However, results of statistical modeling suggested modifications to risk factor weightings could improve risk classification accuracy, particularly for females and minority youth. Recommendations to implement these changes were accepted and incorporated into the current JIS version of the assessment.

A commitment to periodic revalidation of the *Missouri Juvenile Offender Risk Assessment* helps to ensure lasting stakeholder support for this objective decision-making approach to public safety and disposition equity. By modifying the assessment when necessary to more accurately classify delinquent youth, affected parties can be confident the assessment is performing its intended purpose equally for all. In use for nearly a decade, Missouri's juvenile offender risk assessment was in need of revalidation.

To determine the classification accuracy of the Missouri Juvenile Offender Risk Assessment, the Office of State Courts Administrator (OSCA), Division of Court Programs, Research and Education (CPR&E):

1. Examined how well the original risk assessment classifies youth into low, moderate, and high risk groups by observing recidivism, as measured by Missouri's standardized definition[4]; and

3. Analyzed the available data to determine if alterations to the original risk assessment could improve its performance, particularly for subgroup populations.

III. METHOD

The study group consisted of 14,186 youth with risk assessments for whom a legally sufficient law referral was disposed in 2009. The following information was extracted for each case from the Judicial Information System (JIS) database:

1. Demographic information including ethnicity, gender, and reporting circuit;
2. Data from a risk assessment and the first sampled sufficient law referral in 2009; and
3. Outcome data on subsequent legally sufficient law referrals received within 12-months of the first referral legally sufficient law referral disposition.

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[4] A juvenile offender recidivist is any youth, referred to the juvenile office for a legally sufficient law violation during a calendar year, who receives one or more legally sufficient law violation(s) to the juvenile or adult court within one year of the initial referral's disposition date.

A.   Youth and Referral Characteristics

The majority of youth selected for study were from rural circuits (73.4%), with the remaining 26.6% from urban circuits, defined as St. Louis City [Ct22], Jackson [Ct16] and St. Louis [Ct21] counties (Table 1).

Table 1: Number of Youth Selected for Study by Circuit Location					
Circuit	**N**	**%**	**Circuit**	**N**	**%**
1	60	.4	**24**	463	3.3
2	82	.6	**25**	320	2.3
3	49	.3	**26**	329	2.3
4	81	.6	**27**	139	1.0
5	480	3.4	**28**	274	1.9
6	169	1.2	**29**	306	2.2
7	475	3.3	**30**	353	2.5
8	171	1.2	**31**	483	3.4
9	65	.5	**32**	436	3.1
10	186	1.3	**33**	271	1.9
11	1078	7.6	**34**	133	.9
12	219	1.5	**35**	192	1.4
13	795	5.6	**36**	149	1.1
14	187	1.3	**37**	123	.9
15	231	1.6	**38**	361	2.5
16	391	2.8	**39**	252	1.8
17	630	4.4	**40**	10	.1
18	222	1.6	**41**	90	.6
19	332	2.3	**42**	200	1.4
20	324	2.3	**43**	150	1.1
21	1638	11.5	**44**	60	.4
22	672	4.7	**45**	182	1.3
23	373	2.6	**Total**	**14186**	**100.0%**

The demographic characteristics of selected youth and the nature of their referrals are presented in Table 2. Over two thirds of the youth were white (71.8%) and male (70.2%). The most serious allegation for most referrals was a misdemeanor or class C&D felony (90.9%). Only 3.2% of the sampled referrals were for a class A or B felony.

Table 2: Demographic Characteristics of Referral and Youth		
Demographic Characteristic	**N**	**%**
Total Number of Youth	**14186**	**100**
Gender [Missing = 40]		
Male	9952	70.2
Female	4194	29.6
Race [Missing =167]		
White	10183	71.8
African American	3502	24.7
Hispanic	250	1.8
American Indian	28	.2
Asian or Pacific Islander	56	.4
Urban		
Rural	10407	73.4
Urban	3779	26.6
Offense Severity [Missing = 20]		
Infraction, Municipal, Juvenile [curfew]	813	5.7
Misdemeanor, C&D Felony	12897	90.9
A&B Felony	456	3.2
Major Offense Type [Missing = 19]		
Homicide	12	.1
Sexual Assault	155	1.1
Robbery	101	.7
Assault	3234	22.8
Burglary	627	4.4
Stealing	3104	21.9
Kidnapping	6	.0
Arson	121	.9
Forgery	15	.1
Fraud	27	.2
Sex Offenses	324	2.3
Property Damage	1571	11.1
Stolen Property	102	.7
Obscenity	29	.2
Family Offenses	5	.0
Obstructing Police	148	1.0
Flight/Escape	2	.0
Obstructing Judicial Process	41	.3
Weapons	257	1.8
Dangerous Drugs	1327	9.4
Liquor Laws	679	4.8
Peace Disturbance	911	6.4
Health & Safety	106	.7
Conservation	46	.3
Motor Vehicle Violations	121	.9
Public Order Crimes	9	.1
Invasion of Privacy	423	3.0
Threats	37	.3
Juvenile Offenses [Curfew], Municipal and Other	617	4.3

Table 3 shows the prevalence of the risk factors for selected youth. Slightly more than 28% were age 12 or under at the time of their first referral for a delinquency offense, and 58.2% had a prior referral. Less than one-fourth (23.8%) had a prior out-of-home placement, 16.1% were maltreated as a child, and 29.2% were reported to have a substance abuse problem. Over half (52.8%) had school-related behavior problems.

Table 3: Distribution of Risk Assessment Items		
Risk Assessment Item	N	%
Total Youth Assessed	14186	100
Age at First Referral		
16	2316	16.3
15	2698	19.0
14	2839	20.0
13	2319	16.3
12 and under	4014	28.3
Prior Referrals		
None	5924	41.8
One or more	8262	58.2
Assault Referrals (Prior or Present)		
No prior or present assault referral	9005	63.5
One or more misdemeanor assault	4643	32.7
One or more felony assault	538	3.8
History of Placement		
No prior out-of-home	10808	76.2
Prior out-of-home	3378	23.8
Peer Relationships		
Neutral influence	5729	40.4
Negative influence	6711	47.3
Strong negative influence	1746	12.3
History of Child Abuse/ Neglect		
No prior CA/N	11898	83.9
Prior CA/N history	2288	16.1
Substance Abuse		
No problem	10039	70.8
Moderate problem	3447	24.3
Severe dependence	700	4.9
School Behavior Problems		
No or minor problems	6690	47.2
Moderate problems	5366	37.8
Severe problems	2130	15.0
Parental Management Style		
Positive management	6661	47.0
Moderately ineffective management	5675	40.0
Severely ineffective management	1850	13.0
Parents' Criminal History		
No prior incarceration	10747	75.8
Prior incarceration	3439	24.2

Table 3 shows the base rate for a sufficient law violation re-referral for all youth, and subgroup youth based on ethnicity and gender during the 12-month follow-up period. For the entire group, 29.5% received a subsequent sufficient law violation; 17% received a sufficient class A misdemeanor or C/D felony; and 6.7% received a sufficient felony subsequent to their first disposed referral in 2009. Recidivism rates differed considerably among subgroups. For example, 27.2% of white youth and 35.9% of non-white youth received a subsequent sufficient law referral in the follow-up period. Male youth re-offended at a higher rate (32.4%) than their female counterparts (22.7%).

It is easier to construct a risk assessment that classifies subgroups similarly when the base rate for the outcome measure is somewhat equitable across groups. Table 3 illustrates the challenge for the current risk assessment where the difference in base rate for white and non-white youth is nearly 9.0%. Even more disparate is the recidivism rate by gender, with male youth recidivating nearly 10% more often than their female counterparts. The other two outcomes show somewhat less disparity by gender and ethnicity.

Table 3: Risk Re-Validation Base Rates				
Group	N	Sufficient Law Referral	Sufficient Class A Misd or Felony	Sufficient Felony
Youth	14186	29.5%	17%	6.7%
White	10183	27.2%	15.1%	5.4%
Non-White	3836	35.9%	22.3%	10.5%
Missing	*167*			
Male	9952	32.4%	18.9%	8.5%
Female	4194	22.7%	12.5%	2.6%
Missing	*40*			
Urban	3779	29.7%	20.5%	9.5%
Rural	10407	29.4%	15.7%	5.7%

Although results of all three outcome measures are reviewed, subsequent sufficient law and subsequent felony are considered the primary outcome measures. The subsequent sufficient law referral outcome is considered an important measure because it most closely matches the last validation study performed by the National Council on Crime and Delinquency (NCCD) and is supported by the standardized state level definition of recidivism. The subsequent sufficient felony referral outcome is considered important because of the seriousness of these offenses and recidivism rates are somewhat less disparate across key subgroups.

B.   Method of Analysis

The analysis presented in this report had two goals: 1) to assess the performance of the current risk assessment, and 2) to determine if modifications to the assessment could improve its classification accuracy, particularly for subgroup youth. To achieve these goals, the analysis was performed in steps. First, to determine the classification accuracy of the current risk assessment cross tabulations between risk level classifications and the three outcomes for all youth and key subgroups based on gender, ethnicity and type (rural versus urban) were performed.

The second step of the analysis was to determine if modifications to the existing assessment would improve performance. This involved an evaluation of risk items and their associated weights (the number of points received when an item was found true) relative to the recidivism outcomes, and an evaluation of the efficacy of the cut points that classify youth as low, moderate or high risk.

The final step of the study involved constructing a risk assessment comprised only of factors with positive associations with recidivism. This assessment was developed by observing the relationship between youth and family characteristics observed at the time of the referral and subsequent sufficient law referrals received for the youth overall and for subgroups. This analysis involved logistic regression modeling to identify the relative strength of each risk factor, controlling for the influence of the others.

V. FINDINGS

An effective or "valid" risk assessment has progressively higher recidivism rates that correspond to each increase in risk classification level across multiple outcomes. Ideally, the rates between consecutive risk levels maximize the distinction between the high and low risk groups, as well as between consecutive risk groups. In other words, an increase in risk level should correspond to a significant increase in recidivism. The best way to assess the performance of the risk assessment versions, then, is to compare the separation between risk levels:

1. between the low and high risk groups; and
2. between consecutive groups.

These comparisons were made for the total group of youth as well as subgroups defined by youths' ethnicity, gender, and geographic location. The findings ahead compare the distribution and performance of the current risk assessment to alternative versions of the assessment derived from this analysis of the overall selected group of youth and for subgroups.

The risk assessment versions presented are:

1. The *current risk assessment*: the risk assessment currently used by Missouri officers.

2. The *current risk assessment with revised cut points*: the current risk assessment with no changes to the items but the revised cut points are defined as low risk, -3 to1; moderate risk, 2 to 7; and high risk, 8 points or more.

3. The *current risk assessment with re-weighted items*: the current risk assessment with item weights reduced for all risk items, and cut points altered relative to the new distribution of risk scores. To clarify, this version retains all risk items and choices per item on the current risk assessment, but changes the number of points assigned when an item is found true. These changes are reviewed in Appendix B.

4. The *re-developed risk assessment*: the risk assessment that resulted from a complete multivariate analysis of the data. This assessment includes many of the re-weighted items that are present in the previous version of the assessment, but includes additional changes. These additional changes are: a) replacing the current assault referral item to a yes/no item (dropping the separation between felony and misdemeanor assault referrals); b) collapsing moderate and severe school problems into one category for the school behavior item; c) similarly collapsing the parental management item; and d) eliminating the history of child abuse and neglect, and age at first referral factors. This assessment is also shown in Appendix B.

A.   Risk Assessment Classification Findings for the Overall Group

As expected, each of these risk assessment versions resulted in slightly different risk level distributions (Table E1). The current risk assessment classified 23.5% of youth as low risk, 61.2% as moderate risk and 15.3% as high risk. In comparison, the other risk assessment versions classified a smaller proportion of the youth as moderate and high risk. The current risk assessment with revised cut points classified 52.1% of youth as moderate risk and 15.3% as high risk. The current risk assessment with revised cut points and re-weighted items classified 62.8% of youth as moderate risk and 14.1% as high risk. The re-developed assessment classified 59.5% of the youth as moderate risk and 11.9% as high risk, the smallest proportion of high risk youth of all versions.

Table 5: Risk Level Distribution by Risk Assessment Version								
	Low Risk		Moderate Risk		High Risk		Total	
	N	%	N	%	N	%	N	%
1. Current Risk Assessment	3333	**23.5%**	8686	**61.2%**	2167	**15.3%**	14186	**100.0%**
2. Current Risk Assessment with Revised Cut Points	4622	**32.6%**	7397	**52.1%**	2167	**15.3%**	14186	**100.0%**
3. Current Risk Assessment with Re-Weighted Items[5]	4969	**35.0%**	7216	**50.9%**	2001	**14.1%**	14186	**100.0%**
4. Re-Developed Risk Assessment	4056	**28.6%**	8443	**59.5%**	1687	**11.9%**	14186	**100.0%**

Table 6-8 compares risk assessment versions by outcomes for all youth. Although all risk assessment versions classified youth such that an increase in the risk level corresponded to a statistically significant increase in re-referral rate (Appendix A for regression results), the rate differed among the versions.

Table 6 and Figure 1 show that when the current risk assessment is applied 8.6% of low risk youth and 31.5% of moderate risk youth re-offended through a sufficient law referral. High risk youth had a re-referral rate of 53.7%, making their rate **5.2** times greater than their low risk counterparts[6].

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5 This version also has, by necessity, revised cut points. For ease of reference, however, future tables will use the label 'the Current Risk Assessment with Re-Weighted Items.'

6 This comparison (a percentage increase) is calculated by dividing the difference in rates by the lower rate. For example, the (high risk rate – low risk rate) is divided by the low risk rate. The purpose of this comparison is to enable comparisons of differences, while controlling for the lower rate. For example, the difference between low-moderate risk and moderate-high risk might both be 10%, but the percentage increase would be very different.

When the current risk assessment with revised cut points is applied, low risk youth had a 10.2% re-referral rate, while 53.7% of high risk youth had a subsequent referral (**4.3** times greater than that of low risk youth). For the current risk assessment with revised cut points and re-weighted items, 9.7% of youth classified as low risk and 55.1% of youth classified as high risk had a subsequent referral (**4.7** times greater than that of low risk youth). Youth classified low risk by the re-developed tool had a re-referral rate of 6.8%, while high risk youth had a re-referral rate of 57.4% (**7.4** times greater than the rate for low risk youth).

Table 6: Findings for Subsequent Sufficient Law Referral by Risk Assessment Version

	Total N	Subsequent Sufficient Law Referral	
		N	%
Total Sample	14186	4182	**29.5%**
1. Current Risk Assessment			
Low Risk	3333	287	**8.6%**
Moderate Risk	8686	2732	**31.5%**
High Risk	2167	1163	**53.7%**
2. Current Risk Assessment with Revised Cut Points			
Low Risk	4622	471	**10.2%**
Moderate Risk	7397	2548	**34.4%**
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3. Current Risk Assessment with Re-Weighted Items			
Low Risk	4969	484	**9.7%**
Moderate Risk	7216	2596	**36.0%**
High Risk	2001	1102	**55.1%**
4. Re-Developed Risk Assessment			
Low Risk	4056	274	**6.8%**
Moderate Risk	8443	2939	**34.8%**
High Risk	1687	969	**57.4%**

Figure 1

Table 7 and Figure 2 compares classification findings when the outcome is sufficient class A misdemeanors, or felony offenses. Applying the current risk assessment, 4.8% of low risk youth had a subsequent class A misdemeanor, or felony during the follow-up period compared to 30.0% of high risk youth (**5.3** times greater than for low risk youth). For the current risk assessment with revised cut points, corresponding outcome rates were 5.7% and 30.0% (**4.3** times). For the current risk assessment with re-weighted items, the outcome rates for low and high risk youth were 5.5% and 31.0% (**4.6** times). The re-developed risk assessment showed the greatest difference in re-referral rates between low and high risk youth (3.6% and 34.2%, or **8.5** times).

Table 7: Findings for Subsequent Sufficient Class A Misdemeanor or Felony Referral by Risk Assessment Version

	Total N	Subsequent Class A Misdemeanor or Felony Referral	
		N	%
Total Sample	**14186**	**2408**	**17%**
1. Current Risk Assessment			
Low Risk	3333	161	**4.8%**
Moderate Risk	8686	1597	**18.4%**
High Risk	2167	650	**30.0%**
2. Current Risk Assessment with Revised Cut Points			
Low Risk	4622	263	**5.7%**
Moderate Risk	7397	1495	**20.2%**
High Risk	2167	650	**30.0%**
3. Current Risk Assessment with Re-Weighted Items			
Low Risk	4969	272	**5.5%**
Moderate Risk	7216	1515	**21.0%**
High Risk	2001	621	**31.0%**
4. Re-Developed Risk Assessment			
Low Risk	4056	146	**3.6%**
Moderate Risk	8443	1685	**20.0%**
High Risk	1687	577	**34.2%**
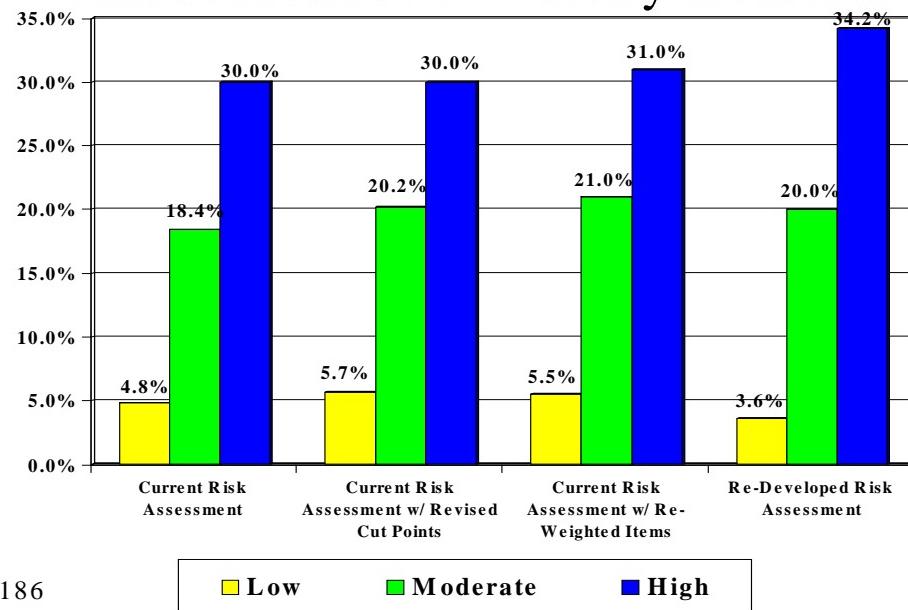
Figure 2

The current and redeveloped risk assessments also achieve greater separation between low risk and high risk youth when the outcome measure is subsequent sufficient felony referrals. Table 8 and Figure 3 shows that when the current risk assessment is applied 1.5% of low risk youth received a subsequent sufficient felony law referral, while 15.1% of high risk youth were referred for felony charges (**9.0** times greater than for low risk youth). With revised cut points, low risk youth had a 2.0% recidivism rate versus 15.1% for high risk youth (**6.5** times). Using the re-weighted or re-developed risk assessment, the rate of subsequent felonies referrals for high risk youth was **7.7 to 13.0** times greater than that of low risk youth.

Table 8: Findings for Subsequent Sufficient Felony Referral by Risk Assessment Version			
		Subsequent Sufficient Felony Referral	
	Total N	**N**	**%**
Total Sample	14186	953	**6.7%**
1. Current Risk Assessment			
Low Risk	3333	50	**1.5%**
Moderate Risk	8686	575	**6.6%**
High Risk	2167	328	**15.1%**
2. Current Risk Assessment with Revised Cut Points			
Low Risk	4622	92	**2.0%**
Moderate Risk	7397	533	**7.2%**
High Risk	2167	328	**15.1%**
3. Current Risk Assessment with Re-Weighted Items			
Low Risk	4969	90	**1.8%**
Moderate Risk	7216	550	**7.6%**
High Risk	2001	313	**15.6%**
4. Re-Developed Risk Assessment			
Low Risk	4056	47	**1.2%**
Moderate Risk	8443	621	**7.4%**
High Risk	1687	285	**16.9%**

Findings for Subsequent Sufficient Felony Referral

N = 14,186
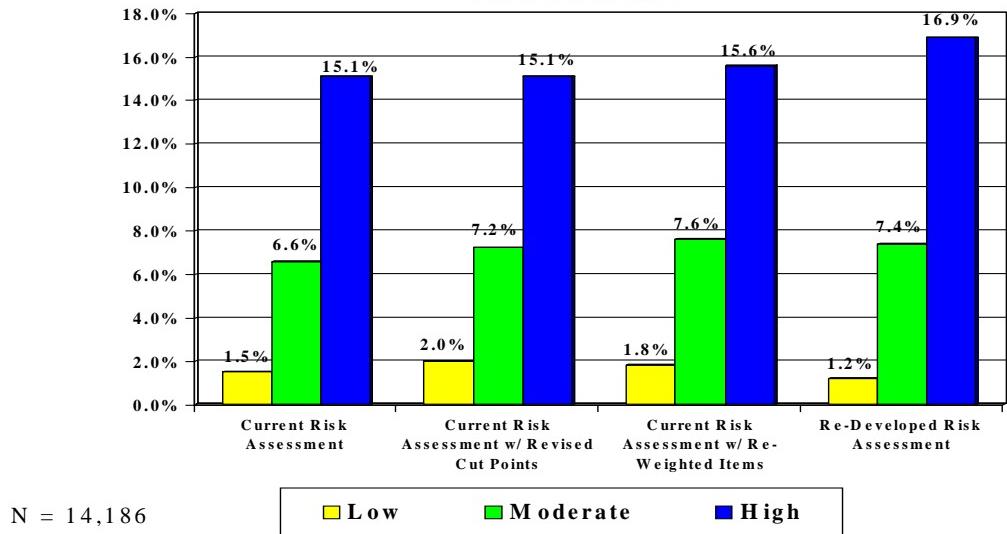
Figure 3

B. Risk Assessment Classification Findings by Gender

Tables 9 through 12 present findings of the three outcomes for the four risk assessment versions by gender. Table 9 shows the risk level distributions for males and females were similar across all risk scale versions, with proportionately more females classified as low risk and more males classified high risk. Regardless of gender, proportionately fewer youth were assessed as moderate and high risk, and proportionately more were classified low risk by the revised, re-weighted and redeveloped versions.

Table 9: Risk Level Distribution by Youth Gender

	Male		Female		Overall	
	N	**%**	**N**	**%**	**N**	**%**
Total Sample	9952	100%	4194	100%	14146	100%
1. Current Risk Assessment						
Low Risk	2153	**21.6%**	1168	**27.8%**	3321	23.5%
Moderate Risk	6131	**61.6%**	2531	**60.3%**	8662	61.2%
High Risk	1668	**16.8%**	495	**11.8%**	2163	15.3%
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3041	**30.6%**	1562	**37.2%**	4603	32.5%
Moderate Risk	5243	**52.7%**	2137	**51.0%**	7380	52.2%
High Risk	1668	**16.8%**	495	**11.8%**	2163	15.3%
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3283	**33.0%**	1665	**39.7%**	4948	35.0%
Moderate Risk	5097	**51.2%**	2103	**50.1%**	7200	50.9%
High Risk	1572	**15.8%**	426	**10.2%**	1998	14.1%
4. Re-Developed Risk Assessment						
Low Risk	2661	**26.7%**	1375	**32.8%**	4036	28.5%
Moderate Risk	5976	**60.0%**	2448	**58.4%**	8424	59.6%
High Risk	1315	**13.2%**	371	**8.8%**	1686	11.9%

Note: 40 youth lacked gender information.

Table 10 presents findings, by gender, for the four risk assessment versions when the outcome is a subsequent sufficient law referral. Overall, males were 43% more likely to re-referred than females (base rates 32.4% and 22.7%, respectively). Despite the significant difference in base rates, all risk assessment versions classified both male and female youth such that an increase in the risk level corresponded to a statistically significant increase in the re-referral rate (Appendix A for regression results).

The current and re-developed risk assessment versions produced the most similar re-referral rates across gender and greater separation between risk categories than the revised and re-weighted versions. Using the current risk assessment, high risk males were 20% more likely than high risk females to be re-referred for a sufficient law violation. In addition, 6.5% of females classified as low risk by the current version received a subsequent sufficient law referral and 46.5% of high risk females were similarly referred (**6.1** times greater than low risk females). The re-referral rate was **4.8** times greater for high risk males (55.9%) compared with their low risk (9.7%) counterparts, applying the current version.

Whereas high risk females were re-referred **.81** times more often than moderate risk females under the current assessment version, high risk males were referred **.64** times more than their moderate risk counterparts.

The re-developed assessment version outperformed the current version with high risk males only 16% more likely than high risk females to be re-referred for a sufficient law referral. Further, 4.8% of low risk and 50.9% of high risk females re-referred (**9.6** times greater than the rate for low risk females). The re-referral rate was **6.7** times greater for high risk males (59.2%) compared with their low risk (7.7%) counterparts. The re-developed performed comparably with the current version when moderate and high risk youth were compared. For the redeveloped assessment, high risk females were re-referred **.79** times more often than moderate risk females. Similar comparisons for males show that high risk males were **.58** times more likely than moderate risk males to be re-referred under the re-developed version.

Neither of the remaining risk assessment versions performed as well as the current or redeveloped assessment versions in terms of similarity of re-referral rates between genders and separation among risk levels. However, these models distribute the number of youth among the three classification levels with fewer youth in the moderate and high risk categories.

Table 10: Findings for Subsequent Sufficient Law Referral by Youth Gender

	Male			Female		
	Total N	**Subsequent Law Referral**		**Total N**	**Subsequent Law Referral**	
		N	**%**		**N**	**%**
Total Sample	9952	3223	**32.4%**	4194	951	**22.7%**
1. Current Risk Assessment						
Low Risk	2153	209	**9.7%**	1168	76	**6.5%**
Moderate Risk	6131	2082	**34.0%**	2531	645	**25.5%**
High Risk	1668	932	**55.9%**	495	230	**46.5%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3041	350	**11.5%**	1562	119	**7.6%**
Moderate Risk	5243	1941	**37.0%**	2137	602	**28.2%**
High Risk	1668	932	**55.9%**	495	230	**46.5%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3283	360	**11.0%**	1665	122	**7.3%**
Moderate Risk	5097	1961	**38.5%**	2103	630	**30.0%**
High Risk	1572	902	**57.4%**	426	199	**46.7%**
4. Re-Developed Risk Assessment						
Low Risk	2661	205	**7.7%**	1375	66	**4.8%**
Moderate Risk	5976	2239	**37.5%**	2448	696	**28.4%**
High Risk	1315	779	**59.2%**	371	189	**50.9%**

Tables 11 and 12 compare the four risk assessment versions when subsequent sufficient class A misdemeanor and felony law referral is the outcome measure. Again, despite the significant difference in base rates, all of the risk assessment versions classified both male and female youth such that an increase in the risk level corresponded to an increase in the re-referral rate. However, only the current and re-developed assessments were able to attain a relatively high degree of separation between moderate and high risk youth. The increase in re-referral rates for moderate to high risk youth was less than 50% for other versions for both males and females. The re-developed assessment produced the greatest distinction in re-referral rates between low and high risk male and female youth for both outcome types.

Table 11: Findings for Subsequent Sufficient Class A Misdemeanor or Felony by Youth Gender

	Male			Female		
	Total	Subsequent Class A Misd or Felony Referral		Total	Subsequent Class A Misd or Felony Referral	
	N	N	%	N	N	%
Total Sample	9952	1882	**18.9%**	14194	523	**12.5%**
1. Current Risk Assessment						
Low Risk	2153	117	**5.4%**	1168	44	**3.8%**
Moderate Risk	6131	1230	**20.1%**	2531	364	**14.4%**
High Risk	1668	535	**32.1%**	495	115	**23.2%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3041	196	**6.4%**	1562	67	**4.3%**
Moderate Risk	5243	1151	**22.0%**	2137	341	**16.0%**
High Risk	1668	535	**32.1%**	495	115	**23.2%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3283	202	**6.2%**	1665	70	**4.2%**
Moderate Risk	5097	1154	**22.6%**	2103	358	**17.0%**
High Risk	1572	526	**33.5%**	426	95	**22.3%**
4. Re-Developed Risk Assessment						
Low Risk	2661	112	**4.2%**	1375	34	**2.5%**
Moderate Risk	5976	1286	**21.5%**	2448	396	**16.2%**
High Risk	1315	484	**36.8%**	371	93	**25.1%**

Table 12: Findings for Subsequent Sufficient Felony by Youth Gender

	Male			Female		
	Total	Subsequent Felony Referral		Total	Subsequent Felony Referral	
	N	N	%	N	N	%
Total Sample	9952	842	**8.5%**	4194	111	**2.6%**
1. Current Risk Assessment						
Low Risk	2153	43	**2.0%**	1168	7	**.6%**
Moderate Risk	6131	506	**8.3%**	2531	69	**2.7%**
High Risk	1668	293	**17.6%**	495	35	**7.1%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3041	82	**2.7%**	1562	10	**.6%**
Moderate Risk	5243	467	**8.9%**	2137	66	**3.1%**
High Risk	1668	293	**17.6%**	495	35	**7.1%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3283	81	**2.5%**	1665	9	**.5%**
Moderate Risk	5097	475	**9.3%**	2103	75	**3.6%**
High Risk	1572	286	**18.2%**	426	27	**6.3%**
4. Re-Developed Risk Assessment						
Low Risk	2661	43	**1.6%**	1375	4	**.3%**
Moderate Risk	5976	544	**9.1%**	2448	77	**3.1%**
High Risk	1315	255	**19.4%**	371	30	**8.1%**

C. **Risk Assessment Classification Findings by Ethnicity of the Youth**

Tables 14 through 16 present re-referral findings for the risk assessment versions for white and non-white youth. All versions of the risk assessment classified a higher proportion of non-white youth as high risk (Table 14). However, proportionately fewer youth were assessed as moderate and high risk, and proportionately more were classified low risk by the revised, re-weighted and redeveloped versions, regardless of ethnicity.

Table 14: Risk Level Distribution by Youth Ethnicity						
	White		Non-White		Overall	
	N	%	N	%	N	%
Total Sample	10183	100%	3836	100%	14019	100
1. Current Risk Assessment						
Low Risk	2665	**26.2%**	595	**15.5%**	3260	23.3%
Moderate Risk	6176	**60.7%**	2421	**63.1%**	8597	61.3%
High Risk	1342	**13.2%**	820	**21.4%**	2162	15.4%
2. Current Assessment with Revised Cut Points						
Low Risk	3637	**35.7%**	892	**23.3%**	4529	32.3%
Moderate Risk	5204	**51.1%**	2124	**55.4%**	7328	52.3%
High Risk	1342	**13.2%**	820	**21.4%**	2162	15.4%
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3886	**38.2%**	984	**25.7%**	4870	34.7%
Moderate Risk	5072	**49.8%**	2083	**54.3%**	7155	51.0%
High Risk	1225	**12.0%**	769	**20.0%**	1994	14.2%
4. Re-Developed Risk Assessment						
Low Risk	3165	**31.1%**	808	**21.1%**	3973	28.3%
Moderate Risk	5998	**58.9%**	2368	**61.7%**	8366	59.7%
High Risk	1020	**10.0%**	660	**17.2%**	1680	12.2%

Note: 167 youth lacked race information.

Table 15 presents findings, by ethnicity, for the four risk assessment versions by when the outcome is a subsequent sufficient law referral. Overall, nonwhite youth were 32% more likely to have a subsequent referral than white youth (base rates are 35.9% and 27.2% respectively). Again, despite the significant difference in base rates, all risk assessment versions classified both white and non-white youth such that an increase in the risk level corresponded to a statistically significant increase in the re-referral rate (Appendix A for regression results).

Table 15 shows the current and revised risk assessment versions produced the most similar re-referral rates across ethnicity when the outcome measure was subsequent sufficient law referrals, followed closely by the redeveloped version. More importantly, the current and redeveloped risk assessments produced the greatest separation among risk levels. Applying the current risk assessment, high risk non-white youth were 19% more likely than high risk white youth to be re-referred. In addition, 8.7% of non-white youth classified low risk and 59.4% of high risk non-white youth were re-referred (**5.8** times greater than for low risk non-white youth). The re-referral rate was **4.8** times greater for high risk white youth (50.1%) than for their low risk (8.6%) counterparts.

The re-developed assessment version performed similar to the current version with high risk non-white youth 19% more likely than high risk white youth to be re-referred for a sufficient law violation. Further, 7.4% of non-white low risk youth received a subsequent sufficient law referral, and 63.5% of high risk non-white youth were similarly referred (**7.6** times greater than low risk non-white youth). The re-referral rate was **7.1** times greater for high risk white youth (53.4%) than for their low risk (6.6%) counterparts. The re-developed and current risk assessment versions performed comparably when moderate and high risk youth were compared. For the redeveloped assessment high risk non-white youth were **.67** times more likely than moderate risk non-white youth to be re-referred. For the current version, high risk non-white youth were .**71** times more likely than moderate risk white youth to be re-referred. Similar comparisons show that high risk white youth were **.58** times more likely than moderate risk white youth to be re-referred applying the re-developed assessment, and **.64** times more likely when the current assessment was applied. Results of regression analysis provide inferential support for these findings (Appendix 9-12 for regression results).

Neither of the remaining risk assessment versions performed as well as the current or redeveloped assessment versions in terms of separation among risk levels or similarity of re-referral rates across ethnic categories. But, again these models distribute the number of youth among the three classification levels with fewer youth in the moderate and high risk categories, regardless of ethnicity.

Table 15: Findings for Subsequent Sufficient Law Referral by Youth Ethnicity

	White			Non-White		
	Total N	**Subsequent Law Referral**		**Total N**	**Subsequent Law Referral**	
		N	**%**		**N**	**%**
Total Sample	10183	2771	**27.2%**	3836	1379	**35.9%**
1. Current Risk Assessment						
Low Risk	2665	229	**8.6%**	595	52	**8.7%**
Moderate Risk	6176	1869	**30.3%**	2421	840	**34.7%**
High Risk	1342	673	**50.1%**	820	487	**59.4%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3637	373	**10.3%**	892	91	**10.2%**
Moderate Risk	5204	1725	**33.1%**	2124	801	**37.7%**
High Risk	1342	673	**50.1%**	820	487	**59.4%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3886	384	**9.9%**	984	92	**9.3%**
Moderate Risk	5072	1763	**34.8%**	2083	813	**39.0%**
High Risk	1225	624	**50.9%**	769	474	**61.6%**
4. Re-Developed Risk Assessment						
Low Risk	3165	210	**6.6%**	808	60	**7.4%**
Moderate Risk	5998	2016	**33.6%**	2368	900	**38.0%**
High Risk	1020	545	**53.4%**	660	419	**63.5%**

Table 16 and 17 compare the four risk assessment versions when subsequent sufficient class A and felony law referral was the outcome measure. Again, despite the significant difference in base rates, all of the risk assessment versions classified both non-white and white youth such that an increase in the risk level corresponded to an increase in the re-referral rate. However, the current and re-developed assessments attained the largest degree of separation between moderate and high risk youth. The increase in re-referral rates for moderate to high risk youth was less than 50% for other versions for both non-white and white youth. The re-developed assessment produced the greatest distinction in re-referral rates between low and high risk male and female youth for both outcome types.

Table 16: Findings for Subsequent Sufficient Class Misdemeanor or Felony by Youth Ethnicity

	White			Non-White		
	Total N	**Subsequent Sufficient Class A Misd or Felony Referral**		**Total N**	**Subsequent Sufficient Class A Misd or Felony Referral**	
		N	**%**		**N**	**%**
Total Sample	10183	1533	**15.1%**	3836	856	**22.3%**
1. Current Risk Assessment						
Low Risk	2665	119	**4.5%**	595	39	**6.6%**
Moderate Risk	6176	1054	**17.1%**	2421	530	**21.9%**
High Risk	1342	360	**26.8%**	820	287	**35.0%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3637	195	**5.4%**	892	64	**7.2%**
Moderate Risk	5204	978	**18.8%**	2124	505	**23.8%**
High Risk	1342	360	**26.8%**	820	287	**35.5%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3886	203	**5.2%**	984	64	**6.5%**
Moderate Risk	5072	991	**19.5%**	2083	514	**24.7%**
High Risk	1225	339	**27.7%**	769	278	**36.2%**
4. Re-Developed Risk Assessment						
Low Risk	3165	106	**3.3%**	808	37	**4.6%**
Moderate Risk	5998	1121	**18.7%**	2368	552	**23.3%**
High Risk	1020	306	**30.0%**	660	267	**40.5%**

Table 17: Findings for Subsequent Sufficient Felony by Youth Ethnicity

	White			Non-White		
	Total N	**Subsequent Sufficient Felony Referral**		**Total N**	**Subsequent Sufficient Felony Referral**	
		N	**%**		**N**	**%**
Total Sample	10183	545	**5.4%**	3836	401	**10.5%**
1. Current Risk Assessment						
Low Risk	2665	35	**1.3%**	595	14	**2.4%**
Moderate Risk	6176	354	**5.7%**	2421	216	**8.9%**
High Risk	1342	156	**11.6%**	820	171	**20.9%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3637	65	**1.8%**	892	26	**2.9%**
Moderate Risk	5204	324	**6.2%**	2124	204	**9.6%**
High Risk	1342	156	**11.6%**	820	171	**20.9%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3886	63	**1.6%**	984	25	**2.5%**
Moderate Risk	5072	336	**6.6%**	2083	211	**10.1%**
High Risk	1225	146	**11.9%**	769	165	**21.5%**
4. Re-Developed Risk Assessment						
Low Risk	3165	31	**1.0%**	808	15	**1.9%**
Moderate Risk	5998	386	**6.4%**	2368	231	**9.8%**
High Risk	1020	128	**12.5%**	660	155	**23.5%**

D. Risk Assessment Classification Findings by Geographic Location

Table 18 shows the distribution by risk level for the four risk assessment versions by location of youth residence [urban vs. rural]. Regardless of version, a similar proportion of urban and rural youth were assigned to low, moderate and high risk categories. The revised and re-weighted version again redistributed more youth to the low and moderate risk categories.

Table 18: Risk Level Distribution by Geographic Location						
	Rural		Urban		Overall	
	N	%	N	%	N	%
Total Sample	10407	**100.0%**	3779	**100.0%**	14186	100.0%
1. Current Risk Assessment						
Low Risk	2382	**22.9%**	951	**25.2%**	3333	23.5%
Moderate Risk	6414	**61.6%**	2272	**60.1%**	8686	61.2%
High Risk	1611	**15.5%**	556	**14.7%**	2167	15.3%
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3282	**31.5%**	1340	**35.5%**	4622	32.6%
Moderate Risk	5514	**53.0%**	1883	**49.8%**	7397	52.1%
High Risk	1611	**15.5%**	556	**14.7%**	2167	15.3%
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3572	**34.3%**	1397	**37.0%**	4969	35.0%
Moderate Risk	5389	**51.8%**	1827	**48.3%**	7216	50.9%
High Risk	1446	**13.9%**	555	**14.7%**	2001	14.1%
4. Re-Developed Risk Assessment						
Low Risk	2908	**27.9%**	1148	**30.4%**	4056	28.6%
Moderate Risk	6298	**60.5%**	2145	**56.8%**	8443	59.5%
High Risk	1201	**11.5%**	486	**12.9%**	1687	11.9%

As with previous subgroup comparisons, each risk assessment version classified youth by location such that an increase in risk corresponded to an increase in recidivism, regardless of outcome measure (Tables 19-21). Table 19 also shows that when comparing risk assessment performance for subsequent sufficient law referrals, the redeveloped version produced the most similar re-referral rates across location, followed by the re-weighted version.

More importantly, the current and redeveloped risk assessments produced the greatest separation among risk categories. Applying the current risk assessment, high risk urban youth were 19% more likely than high risk rural youth to be re-referred for a sufficient law violation. In addition, 5.2% of low risk and 60.8% of high risk urban youth received a subsequent sufficient law referral (**10.6** times greater than for low risk urban youth). The re-referral rate was **4.1** times greater for high risk rural youth (51.2%) than for their low risk (10.0%) counterparts.

The re-developed assessment version outperformed the current version with high risk urban youth only 10% more likely than high risk rural youth to be re-referred for a sufficient law violation. In addition, 3.7% of low risk urban youth were re-referred for subsequent sufficient law referral, and 61.5% of high risk urban youth were similarly referred (**15.6** times greater than low risk urban youth). The re-referral rate was **6.0** times greater for high risk rural youth (55.8%) than their low risk (8.0%) counterparts. However, the current risk assessment version outperformed the redeveloped version when moderate and high risk urban youth were compared. For the current assessment, high risk urban youth were **.88** times more likely than moderate risk urban youth to be re-referred. For the redeveloped instrument, high risk urban youth were **.69** times more likely than moderate risk urban youth to be re-referred. Similar comparisons show that high risk and moderate risk rural youth were equally likely (**.64** times) to be re-referred when either the current or redeveloped assessment version is applied.

Neither of the remaining risk assessment versions performed as well as the current or redeveloped assessment versions in terms of distinction and similarity of re-referral rates by location. But, again these models distribute the number of youth among the three classification levels with fewer youth in the moderate and high risk categories.

Table 19: Findings for Subsequent Sufficient Law Referral by Geographic Location

	Rural			Urban		
	Total N	Subsequent Sufficient Law Referral		Total N	Subsequent Sufficient Law Referral	
		N	%		N	%
Total Sample	10407	3061	**29.4%**	3779	1121	**29.7%**
1. Current Risk Assessment						
Low Risk	2382	238	**10.0%**	951	49	**5.2%**
Moderate Risk	6414	1998	**31.2%**	2272	734	**32.3%**
High Risk	1611	825	**51.2%**	556	338	**60.8%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3282	375	**11.4%**	1340	96	**7.2%**
Moderate Risk	5514	1861	**33.8%**	1883	687	**36.5%**
High Risk	1611	825	**51.2%**	556	338	**60.8%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3572	388	**10.9%**	1397	96	**6.9%**
Moderate Risk	5389	1909	**35.4%**	1827	687	**37.6%**
High Risk	1446	764	**52.8%**	555	338	**60.9%**
4. Re-Developed Risk Assessment						
Low Risk	2908	232	**8.0%**	1148	42	**3.7%**
Moderate Risk	6298	2159	**34.3%**	2145	780	**36.4%**
High Risk	1201	670	**55.8%**	486	299	**61.5%**

Tables 20 and 21 compare the four risk assessment versions when subsequent sufficient class A and felony, and felony law referrals were the outcome measures. All of the risk assessment versions classified both urban and rural youth such that an increase in the risk level corresponded to an increase in the re-referral rate, regardless of version. However, the current and re-developed assessments attained highest degree of separation between moderate and high risk urban and rural youth. The increase in re-referral rates for moderate to high risk youth was less than 50% for other versions for both urban and rural youth. The re-developed assessment produced the greatest distinction in re-referral rates between low and high risk male and female youth for both outcome types.

Table 20: Findings for Subsequent Sufficient Class A Misdemeanor or Felony by Geographic Location

	Rural			Urban		
	Total N	**Subsequent Class A Misd or Felony**		**Total N**	**Subsequent Class A Misd or Felony**	
		N	**%**		**N**	**%**
Total Sample	10407	1633	**15.7%**	3779	775	**20.5%**
1. Current Risk Assessment						
Low Risk	2382	129	**5.4%**	951	32	**3.4%**
Moderate Risk	6414	1072	**16.7%**	2272	525	**23.1%**
High Risk	1611	432	**26.8%**	556	218	**39.2%**
2. Original Risk Assessment with Revised Cut Points						
Low Risk	3282	197	**6.0%**	1340	66	**4.9%**
Moderate Risk	5514	1004	**18.2%**	1883	491	**26.1%**
High Risk	1611	432	**26.8%**	556	218	**39.2%**
3. Current Risk Assessment with Re-Weighted Items						
Low Risk	3572	207	**5.8%**	1397	65	**4.7%**
Moderate Risk	5389	1021	**18.9%**	1827	494	**27.0%**
High Risk	1446	405	**28.0%**	555	216	**38.9%**
4. Re-Developed Risk Assessment						
Low Risk	2908	118	**4.1%**	1148	28	**2.4%**
Moderate Risk	6298	1140	**18.1%**	2145	545	**25.4%**
High Risk	1201	375	**31.2%**	486	202	**41.6%**

Table 21: Findings for Subsequent Sufficient Felony by Geographic Location

	Rural			Urban		
	Total N	**Subsequent Felony**		**Total N**	**Subsequent Felony**	
		N	**%**		**N**	**%**
Total Sample	10407	595	**5.7%**	3779	358	**9.5%**
1. Current Risk Assessment						
Low Risk	2382	40	**1.7%**	951	10	**1.1%**
Moderate Risk	6414	365	**5.7%**	2272	210	**9.2%**
High Risk	1611	190	**11.8%**	556	138	**24.8%**
2. Current Risk Assessment with Revised Cut Points						
Low Risk	3282	68	**2.1%**	1340	24	**1.8%**
Moderate Risk	5514	337	**6.1%**	1883	196	**10.4%**
High Risk	1611	190	**11.8%**	556	138	**24.8%**
3. Original Risk Assessment with Re-Weighted Items						
Low Risk	3572	67	**1.9%**	1397	23	**1.6%**
Moderate Risk	5389	349	**6.5%**	1827	201	**11.0%**
High Risk	1446	179	**12.4%**	555	134	**24.1%**
4. Re-Developed Risk Assessment						
Low Risk	2908	40	**1.4%**	1148	7	**.6%**
Moderate Risk	6298	398	**6.3%**	2145	223	**10.4%**
High Risk	1201	157	**13.1%**	486	128	**26.3%**

V.   SUMMARY

Given the goal of risk assessment is to classify youth according to the likelihood they will re-offend, each increase in risk level should correspond to a significant increase in recidivism, across outcomes. An effective risk assessment is one that maximizes the separation between recidivism rates for the high and low risk groups and consecutive risk groups.

The best way to assess the performance of the risk assessment versions, then, is to compare the separation between risk levels. Following is a summary of how the risk assessment versions compare overall (Table 20) and for subgroups based on gender, ethnicity and location:

- The current and redeveloped risk assessment versions distinguished well between low and high risk youth, outperforming both the revised and re-weighted assessment versions in this respect. Comparison of separation between moderate and high risk youth produced by the current and redeveloped versions show mixed results, with the current assessment outperforming the redeveloped version when the primary outcome measure [subsequent sufficient law referral] is applied and the redeveloped version outperforming the current version when the outcome measure is a subsequent sufficient Class A misdemeanor, or felony. These versions functioned similarly when the outcome measure is subsequent sufficient felony, although the redeveloped version classified proportionately fewer youth as high risk and more evenly distributed moderate and low risk youth.

- Results for the revised and re-weighted version of the assessment were mixed. While the re-weighted version outperformed the revised version in distinguishing between low and high risk youth regardless of outcome measure, the revised version was better at distinguishing between moderate and high risk youth

- Results for subgroups show:

  o The re-developed risk assessment version produced the most similar re-referral rates across gender and the greatest distinction between low and high risk categories when compared with the revised and re-weighted versions, regardless of the outcome measure applied. The current and redeveloped versions performed similarly in distinguishing between moderate and high risk categories.

  o The current and revised risk assessment versions produced the most similar re-referral rates across ethnicity. However, the re-developed risk assessment version produced the greatest distinction between low and high risk categories compared with the revised and re-weighted versions, regardless of the outcome measure applied. The current version slightly outperformed the redeveloped in distinguishing between moderate and high risk categories.

  o Comparing risk assessment performance for subsequent sufficient law referrals, the redeveloped version produced the most similar re-referral rates across location, followed by the re-weighted version. More importantly, the redeveloped risk assessment produced the greatest distinction between low and high risk categories by location. However, the current risk assessment version outperformed the redeveloped one when moderate and high risk urban youth were compared. Similar comparisons show that high risk rural youth were equally likely than moderate risk rural youth to be re-referred when either the current or redeveloped assessment version was applied.

	Subsequent Sufficient Law Referral Outcome			Subsequent Sufficient Class A Misdemeanor or Felony Outcome			Subsequent Sufficient Felony Referral Outcome		
Risk Assessment Version	**From Low to Mod**	**From Mod to High**	**From Low to High**	**From Low to Mod**	**From Mod to High**	**From Low to High**	**From Low to Mod**	**From Mod to High**	**From Low to High**
1. Current Risk Assessment	266%	71%	524%	283%	63%	525%	340%	129%	906%
2. Current Risk Assessment with Revised Cut Points	237%	56%	426%	254%	49%	426%	260%	110%	655%
3. Current Risk Assessment with Re-Weighted Items	271%	53%	468%	282%	48%	464%	322%	105%	767%
4. Re-Developed Risk Assessment	411%	65%	744%	455%	71%	850%	517%	128%	1308%

Table 20
Percentage Increase in Rates between Risk Levels
by Risk Assessment Version

Note: The data shown is percentage increase, calculated by dividing the difference in rates by the rate of the lower risk level. For example, the percentage increase from low to moderate is (low rate – moderate rate)/low rate.

Results of the study show the redeveloped risk assessment attained the best separation between risk levels overall, followed closely by the current version. For subgroups, the two versions performed similarly. However, a recommendation regarding which risk assessment to adopt should be based on policy implications as well as research findings. Policy issues associated with modification of the current risk assessment version include an understanding that:

- Changes would result in corresponding modifications to the JIS CZAASMT assessment form and training materials (which may include changes to definitions);

- Changes would require training officers and other staff on the assessment version selected;

- Changes to the assessment version could influence face validity of the assessment, making officers less confident it accurately classifies youth, although eliminating "weak" risk factors may also improve reliability due to the difficulties obtaining information related to variables such as history of child abuse and neglect and parental incarceration history;

- Changes to the assessment version could affect the proportion of youth assigned to each risk level category, and thereby impact juvenile officer workload;

- Eliminating static factors such as history of child abuse and neglect and parental incarceration history could potentially impact the outcomes for risk reassessment;

VI. SUPPLEMENTAL ANALYSIS OF NEEDS FACTORS

Missouri's juvenile offender classification system includes a needs assessment intended to advise juvenile officers regarding the criminogenic needs of juvenile offenders and direct service provisioning. Because these factors may also be associated with re-offending, a regression analysis which included factors from both [risk and needs] assessments was performed to identify needs factors that may also perform well as risk factors. The findings of this analysis, limited to those youth for whom both a risk and needs assessment was conducted [N=11,183], is contained in Appendix C. Results show that when the influence of other factors was controlled, only the Behavior Problems (Odds ratio = 1.49/1.94) needs factor significantly related to re-offending.

Appendix A

A-1 Current Assessment Risk Level Significance [Overall]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RISKLEVEL			1100.083	2	.000			
RISKLEVEL(1)	1.588	.067	567.398	1	.000	4.896	4.296	5.580
RISKLEVEL(2)	2.511	.076	1093.096	1	.000	12.323	10.618	14.301
Constant	-2.364	.063	1430.114	1	.000	.094		

A-2 Revised Cut-Score Assessment Risk Level Significance [Overall]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RiskRevCutLev			1311.706	2	.000			
RiskRevCutLev (1)	1.533	.054	792.990	1	.000	4.631	4.162	5.152
RiskRevCutLev (2)	2.323	.065	1279.062	1	.000	10.209	8.988	11.595
Constant	2.176	.049	2003.364	1	.000	.113		

A-3 Re-weighted Items and Cut-Score Assessment Risk Level Significance [Overall]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RewRiskLev			1447.394	2	.000			
RewRiskLev(1)	1.650	.054	941.785	1	.000	5.207	4.686	5.786
RewRiskLev(2)	2.430	.066	1370.415	1	.000	11.359	9.988	12.919
Constant	-2.226	.048	2165.452	1	.000	.108		

A-4 Redeveloped Instrument Regression [Overall]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
ReDevLev			1367.598	2	.000			
ReDevLev(1)	1.997	.067	899.441	1	.000	7.370	6.468	8.398
ReDevLev(2)	2.925	.080	1349.424	1	.000	18.628	15.937	21.774
Constant	-2.625	.063	1760.326	1	.000	.072		

A-5 Current Assessment Regression [MALE]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RISKLEVEL			793.371	2	.000			
RISKLEVEL(1)	1.565	.078	406.432	1	.000	4.783	4.108	5.569
RISKLEVEL(2)	2.466	.088	786.792	1	.000	11.778	9.914	13.994
Constant	-2.230	.073	938.586	1	.000	.108		

A-6 Current Assessment Regression [FEMALE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RISKLEVEL			286.895	2	.000			
RISKLEVEL(1)	1.592	.127	156.905	1	**.000**	**4.914**	3.830	6.304
RISKLEVEL(2)	2.523	.149	286.886	1	**.000**	**12.471**	9.313	16.699
Constant	-2.665	.119	504.660	1	.000	.070		

A-7 Redeveloped Assessment Regression [MALE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
ReDevLev			979.990	2	.000			
ReDevLev(1)	1.971	.077	647.551	1	**.000**	**7.178**	6.167	8.355
ReDevLev(2)	2.857	.092	967.842	1	**.000**	**17.412**	14.544	20.846
Constant	-2.483	.073	1166.779	1	.000	.083		

A-8 Redeveloped Assessment Regression [FEMALE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
ReDevLev			350.809	2	.000			
ReDevLev(1)	2.064	.134	237.735	1	**.000**	**7.879**	6.061	10.243
ReDevLev(2)	3.025	.163	342.731	1	**.000**	**20.596**	14.952	28.371
Constant	-2.987	.126	560.734	1	.000	.050		

A-9 Current Assessment Regression [WHITE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RISKLEVEL			726.109	2	.000			
RISKLEVEL(1)	1.530	.074	421.952	1	**.000**	**4.616**	3.989	5.341
RISKLEVEL(2)	2.370	.088	724.231	1	**.000**	**10.701**	9.004	12.718
Constant	-2.364	.069	1170.184	1	.000	.094		

A-10 Current Assessment Regression [NON-WHITE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
RISKLEVEL			324.263	2	.000			
RISKLEVEL(1)	1.713	.151	128.232	1	**.000**	**5.548**	4.124	7.463
RISKLEVEL(2)	2.726	.162	284.399	1	**.000**	**15.271**	11.125	20.964
Constant	-2.346	.145	261.151	1	.000	.096		

A-11 Redeveloped Assessment Regression [WHITE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
ReDevLev			908.180	2	.000			
ReDevLev(1)	1.963	.076	659.301	1	.000	7.124	6.132	8.276
ReDevLev(2)	2.782	.095	855.865	1	.000	16.145	13.400	19.452
Constant	-2.644	.071	1370.800	1	.000	.071		

A-12 Redeveloped Assessment Regression [NON-WHITE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
ReDevLev			393.156	2	.000			
ReDevLev(1)	2.034	.141	208.949	1	.000	7.643	5.801	10.070
ReDevLev(2)	3.076	.157	385.605	1	.000	21.674	15.944	29.464
Constant	-2.523	.134	353.587	1	.000	.080		

Current Risk Assessment Logistic Regression for Revising Item Weights and Cut-Scores								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
GENDER(1)	.385	.047	66.618	1	.000	1.469	1.340	1.611
whnonwhite(1)	.227	.050	20.494	1	.000	1.255	1.138	1.385
URBAN_RURAL(1)	-.068	.053	1.626	1	.202	.935	.842	1.037
Age1st			20.308	4	.000			
Age1st(1)	-.117	.079	2.222	1	.136	.889	.762	1.038
Age1st(2)	-.194	.078	6.129	1	.013	.824	.706	.960
Age1st(3)	-.167	.082	4.202	1	.040	.846	.721	.993
Age1st(4)	-.322	.078	16.985	1	.000	.725	.622	.845
PriorRef(1)	1.560	.056	783.433	1	.000	4.758	4.266	5.307
AssRef			30.847	2	.000			
AssRef(1)	.250	.045	30.773	1	.000	1.283	1.175	1.402
AssRef(2)	.096	.101	.905	1	.341	1.101	.903	1.342
HistPlace(1)	.259	.051	25.387	1	.000	1.295	1.171	1.432
Peers			68.661	2	.000			
Peers(1)	.290	.050	33.868	1	.000	1.336	1.212	1.473
Peers(2)	.602	.075	64.798	1	.000	1.827	1.577	2.115
CAN(1)	-.201	.060	11.329	1	.001	.818	.728	.919
SubAbuse			28.463	2	.000			
SubAbuse(1)	.230	.049	21.889	1	.000	1.258	1.143	1.385
SubAbuse(2)	.353	.094	14.065	1	.000	1.423	1.183	1.711
School			44.255	2	.000			
School(1)	.201	.049	16.455	1	.000	1.222	1.109	1.347
School(2)	.442	.067	43.601	1	.000	1.556	1.365	1.774
ParentMan			9.076	2	.011			
ParentMan(1)	.153	.051	9.066	1	.003	1.165	1.055	1.287
ParentMan(2)	.129	.075	2.920	1	.087	1.137	.981	1.318
ParentIncar(1)	.117	.049	5.630	1	.018	1.124	1.021	1.238
Constant	-2.797	.078	1287.908	1	.000	.061		

Current Risk Assessment Logistic Regression for Redeveloping Risk Assessment [MALE]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
whnonwhite(1)	.244	.058	17.634	1	.000	1.277	1.139	1.431
URBAN_RURAL(1)	-.109	.061	3.158	1	.076	.897	.796	1.011
Age1st			13.080	4	.011			
Age1st(1)	-.102	.093	1.214	1	.271	.903	.752	1.083
Age1st(2)	-.152	.092	2.716	1	.099	.859	.717	1.029
Age1st(3)	-.111	.095	1.347	1	.246	.895	.743	1.079
Age1st(4)	-.283	.090	9.838	1	.002	.753	.631	.899
PriorRef(1)	1.504	.064	547.823	1	.000	4.500	3.967	5.104
AssRef			18.848	2	.000			
AssRef(1)	.220	.052	17.627	1	.000	1.246	1.124	1.381
AssRef(2)	-.014	.111	.016	1	.899	.986	.792	1.227
HistPlace(1)	.222	.059	13.994	1	.000	1.249	1.112	1.403
Peers			65.959	2	.000			
Peers(1)	.348	.058	36.323	1	.000	1.416	1.265	1.585
Peers(2)	.668	.086	60.403	1	.000	1.950	1.648	2.308
CAN(1)	-.194	.070	7.619	1	.006	.824	.718	.945
SubAbuse			20.743	2	.000			
SubAbuse(1)	.209	.057	13.511	1	.000	1.233	1.103	1.379
SubAbuse(2)	.384	.106	13.152	1	.000	1.469	1.193	1.807
School			41.089	2	.000			
School(1)	.226	.058	15.351	1	.000	1.254	1.120	1.404
School(2)	.493	.077	40.580	1	.000	1.637	1.406	1.904
ParentMan			6.311	2	.043			
ParentMan(1)	.143	.059	5.951	1	.015	1.154	1.029	1.295
ParentMan(2)	.070	.088	.637	1	.425	1.072	.903	1.273
ParentIncar(1)	.089	.057	2.427	1	.119	1.093	.977	1.223
Constant	-2.405	.082	854.757	1	.000	.090		

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
whnonwhite(1)	.169	.102	2.772	1	.096	1.185	.970	1.446
URBAN_RURAL(1)	.035	.108	.106	1	.744	1.036	.838	1.281
Age1st			9.635	4	.047			
Age1st(1)	-.186	.148	1.571	1	.210	.831	.621	1.110
Age1st(2)	-.330	.150	4.809	1	.028	.719	.536	.966
Age1st(3)	-.338	.158	4.574	1	.032	.713	.523	.972
Age1st(4)	-.451	.156	8.335	1	.004	.637	.469	.865
PriorRef(1)	1.758	.114	239.516	1	**.000**	**5.801**	4.643	7.247
AssRef			17.470	2	.000			
AssRef(1)	.329	.089	13.717	1	**.000**	**1.389**	1.167	1.653
AssRef(2)	.620	.235	6.961	1	**.008**	**1.858**	1.173	2.945
HistPlace(1)	.380	.103	13.753	1	**.000**	**1.463**	1.196	1.788
Peers			7.337	2	.026			
Peers(1)	.136	.099	1.899	1	.168	1.146	.944	1.391
Peers(2)	.418	.154	7.337	1	**.007**	**1.519**	1.122	2.055
CAN(1)	-.243	.115	4.504	1	.034	.784	.626	.982
SubAbuse			9.513	2	.009			
SubAbuse(1)	.301	.098	9.496	1	**.002**	**1.351**	1.116	1.637
SubAbuse(2)	.185	.209	.778	1	.378	1.203	.798	1.813
School			4.165	2	.125			
School(1)	.117	.097	1.450	1	.229	1.124	.929	1.359
School(2)	.273	.135	4.087	1	**.043**	**1.314**	1.008	1.713
ParentMan			4.677	2	.096			
ParentMan(1)	.174	.102	2.895	1	.089	1.190	.974	1.453
ParentMan(2)	.302	.147	4.200	1	**.040**	**1.353**	1.013	1.806
ParentIncar(1)	.196	.097	4.071	1	**.044**	**1.217**	1.006	1.472
Constant	-2.828	.137	426.268	1	.000	.059		

Current Risk Assessment Logistic Regression for Redeveloping Risk Assessment [FEMALE]

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Current Risk Assessment Logistic Regression for Redeveloping Risk Assessment [WHITE]							
						95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
GENDER(1)	.383	.056	47.333	1	.000	1.466	1.315	1.635
URBAN_RURAL(1)	-.056	.073	.588	1	.443	.945	.819	1.091
Age1st			17.473	4	.002			
Age1st(1)	-.128	.091	1.986	1	.159	.880	.736	1.051
Age1st(2)	-.250	.091	7.494	1	.006	.779	.652	.932
Age1st(3)	-.263	.096	7.542	1	.006	.769	.637	.928
Age1st(4)	-.354	.092	14.948	1	.000	.702	.587	.840
PriorRef(1)	1.621	.067	586.966	1	**.000**	**5.060**	4.438	5.769
AssRef			30.558	2	.000			
AssRef(1)	.298	.054	30.471	1	**.000**	**1.347**	1.212	1.497
AssRef(2)	.189	.146	1.679	1	.195	1.207	.908	1.606
HistPlace(1)	.258	.063	16.686	1	**.000**	**1.294**	1.143	1.464
Peers			48.975	2	.000			
Peers(1)	.319	.058	29.720	1	**.000**	**1.376**	1.227	1.543
Peers(2)	.605	.093	42.053	1	**.000**	**1.831**	1.525	2.199
CAN(1)	-.250	.073	11.666	1	.001	.779	.675	.899
SubAbuse			17.253	2	.000			
SubAbuse(1)	.235	.059	16.120	1	**.000**	**1.265**	1.128	1.419
SubAbuse(2)	.249	.116	4.589	1	**.032**	**1.282**	1.021	1.610
School			16.806	2	.000			
School(1)	.152	.058	6.802	1	**.009**	**1.164**	1.038	1.304
School(2)	.329	.082	16.144	1	**.000**	**1.389**	1.183	1.631
ParentMan			9.457	2	.009			
ParentMan(1)	.186	.061	9.347	1	**.002**	**1.204**	1.069	1.356
ParentMan(2)	.120	.091	1.756	1	.185	1.128	.944	1.347
ParentIncar(1)	.083	.062	1.809	1	.179	1.086	.963	1.226
Constant	-2.792	.091	950.272	1	.000	.061		

Current Risk Assessment Logistic Regression for Redeveloping Risk Assessment [NON-WHITE]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
GENDER(1)	.366	.091	16.308	1	.000	1.442	1.207	1.722
URBAN_RURAL(1)	-.139	.080	3.045	1	.081	.870	.745	1.017
Age1st			7.990	4	.092			
Age1st(1)	-.051	.157	.106	1	.745	.950	.698	1.294
Age1st(2)	-.020	.156	.016	1	.899	.981	.723	1.330
Age1st(3)	.088	.159	.306	1	.580	1.092	.799	1.493
Age1st(4)	-.208	.152	1.861	1	.172	.812	.603	1.095
PriorRef(1)	1.443	.102	201.193	1	**.000**	**4.235**	3.469	5.170
AssRef			4.179	2	.124			
AssRef(1)	.158	.082	3.677	1	.055	1.171	.997	1.377
AssRef(2)	-.020	.143	.019	1	.891	.981	.741	1.298
HistPlace(1)	.279	.089	9.794	1	**.002**	**1.322**	1.110	1.575
Peers			19.776	2	.000			
Peers(1)	.216	.096	5.049	1	**.025**	**1.241**	1.028	1.498
Peers(2)	.573	.129	19.635	1	**.000**	**1.774**	1.377	2.286
CAN(1)	-.078	.105	.554	1	.457	.925	.752	1.137
SubAbuse			12.683	2	.002			
SubAbuse(1)	.218	.092	5.647	1	**.017**	**1.244**	1.039	1.490
SubAbuse(2)	.525	.164	10.204	1	**.001**	**1.690**	1.225	2.332
School			33.451	2	.000			
School(1)	.350	.095	13.437	1	**.000**	**1.418**	1.177	1.710
School(2)	.695	.120	33.351	1	**.000**	**2.003**	1.582	2.535
ParentMan			1.548	2	.461			
ParentMan(1)	.080	.094	.721	1	.396	1.083	.900	1.304
ParentMan(2)	.168	.136	1.511	1	.219	1.183	.905	1.545
ParentIncar(1)	.187	.083	5.049	1	**.025**	**1.206**	1.024	1.419
Constant	-2.631	.163	260.405	1	.000	.072		

Current Risk Assessment Logistic Regression for Redeveloping Risk Assessment [URBAN]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
GENDER(1)	.252	.099	6.479	1	.011	1.286	1.060	1.561
whnonwhite(1)	.083	.094	.774	1	.379	1.086	.904	1.306
Age1st			8.405	4	.078			
Age1st(1)	.134	.154	.752	1	.386	1.143	.845	1.546
Age1st(2)	.128	.156	.670	1	.413	1.136	.837	1.544
Age1st(3)	.278	.165	2.840	1	.092	1.320	.956	1.824
Age1st(4)	-.069	.163	.178	1	.673	.933	.678	1.286
PriorRef(1)	1.528	.104	215.951	1	.000	4.607	3.758	5.648
AssRef			3.538	2	.171			
AssRef(1)	.169	.091	3.421	1	.064	1.184	.990	1.415
AssRef(2)	.021	.164	.017	1	.897	1.021	.741	1.408
HistPlace(1)	.334	.097	11.897	1	**.001**	**1.397**	1.155	1.689
Peers			23.163	2	.000			
Peers(1)	.271	.101	7.251	1	**.007**	**1.311**	1.077	1.598
Peers(2)	.700	.146	23.119	1	**.000**	**2.014**	1.514	2.679
CAN(1)	-.030	.120	.061	1	.805	.971	.767	1.229
SubAbuse			15.262	2	.000			
SubAbuse(1)	.251	.095	6.946	1	**.008**	**1.285**	1.066	1.549
SubAbuse(2)	.569	.159	12.846	1	**.000**	**1.767**	1.294	2.411
School			17.240	2	.000			
School(1)	.301	.103	8.510	1	**.004**	**1.351**	1.104	1.654
School(2)	.547	.134	16.776	1	**.000**	**1.729**	1.330	2.246
ParentMan			7.242	2	.027			
ParentMan(1)	.222	.104	4.576	1	**.032**	**1.248**	1.019	1.530
ParentMan(2)	.401	.161	6.210	1	**.013**	**1.493**	1.089	2.047
ParentIncar(1)	.185	.101	3.387	1	.066	1.204	.988	1.466
Constant	-3.126	.163	368.481	1	.000	.044		

Current Risk Assessment Logistic Regression for Redeveloping Risk Assessment [RURAL]								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
GENDER(1)	.411	.054	58.039	1	.000	1.508	1.357	1.676
whnonwhite(1)	.232	.061	14.342	1	.000	1.262	1.119	1.423
Age1st			22.803	4	.000			
Age1st(1)	-.189	.092	4.174	1	.041	.828	.691	.992
Age1st(2)	-.306	.091	11.247	1	.001	.737	.616	.881
Age1st(3)	-.319	.094	11.425	1	.001	.727	.604	.874
Age1st(4)	-.406	.089	20.693	1	.000	.666	.559	.794
PriorRef(1)	1.605	.067	578.827	1	**.000**	**4.979**	4.368	5.674
AssRef			30.889	2	.000			
AssRef(1)	.289	.052	30.889	1	**.000**	**1.335**	1.206	1.478
AssRef(2)	.149	.130	1.308	1	.253	1.160	.899	1.498
HistPlace(1)	.236	.061	15.060	1	**.000**	**1.267**	1.124	1.427
Peers			46.368	2	.000			
Peers(1)	.293	.058	25.843	1	**.000**	**1.340**	1.197	1.500
Peers(2)	.572	.088	42.141	1	**.000**	**1.772**	1.491	2.106
CAN(1)	-.249	.069	12.875	1	.000	.780	.681	.893
SubAbuse			15.919	2	.000			
SubAbuse(1)	.229	.058	15.764	1	**.000**	**1.257**	1.123	1.408
SubAbuse(2)	.162	.119	1.852	1	**.174**	**1.176**	.931	1.484
School			24.939	2	.000			
School(1)	.172	.057	9.239	1	**.002**	**1.188**	1.063	1.328
School(2)	.387	.078	24.394	1	**.000**	**1.473**	1.263	1.718
ParentMan			3.687	2	.158			
ParentMan(1)	.112	.059	3.606	1	.058	1.118	.996	1.254
ParentMan(2)	.067	.086	.618	1	.432	1.070	.904	1.265
ParentIncar(1)	.106	.057	3.487	1	.062	1.112	.995	1.243
Constant	-2.696	.088	930.290	1	.000	.067		

Current Risk Assessment Logistic Regression for Assessing Needs Factors								
							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
whnonwhite(1)	.160	.059	7.259	1	.007	1.173	1.044	1.318
GENDER(1)	.389	.053	54.657	1	.000	1.476	1.331	1.636
URBAN_RURAL(1)	.047	.075	.398	1	.528	1.048	.905	1.215
Age1st(1)	-.212	.091	5.451	1	.020	.809	.677	.967
Age1st(2)	-.294	.089	10.891	1	.001	.745	.626	.887
Age1st(3)	-.332	.093	12.822	1	.000	.717	.598	.860
Age1st(4)	-.450	.089	25.827	1	.000	.638	.536	.759
PriorRef	1.644	.066	616.312	1	.000	5.178	4.547	5.895
AssRef			28.538	2	.000			
AssRef(1)	.261	.050	27.307	1	.000	1.298	1.177	1.431
AssRef(2)	.018	.111	.026	1	.872	1.018	.820	1.264
HistPlace(1)	.220	.058	14.675	1	.000	1.247	1.114	1.395
Peers			24.825	2	.000			
Peers(1)	.211	.056	14.180	1	.000	1.235	1.107	1.379
Peers(2)	.408	.086	22.556	1	.000	1.504	1.271	1.780
CAN(1)	-.285	.067	18.145	1	.000	.752	.660	.858
SubAbuse(1)	.203	.055	13.567	1	.000	1.225	1.099	1.364
SubAbuse(2)	.162	.109	2.212	1	.137	1.176	.950	1.457
School			3.569	2	.168			
School(1)	.060	.060	.976	1	.323	1.061	.943	1.195
School(2)	.161	.085	3.563	1	.059	1.174	.994	1.387
ParentMan			2.789	2	.248			
ParentMan(1)	-.044	.063	.480	1	.488	.957	.846	1.083
ParentMan(2)	-.152	.093	2.672	1	.102	.859	.716	1.031
ParentIncar(1)	.079	.058	1.860	1	.173	1.083	.966	1.214
BehavProb			52.630	2	.000			
BehavProb(1)	.404	.065	39.223	1	.000	1.498	1.320	1.700
BehavProb(2)	.664	.099	45.389	1	.000	1.943	1.602	2.357
Attitude			4.957	2	.084			
Attitude(1)	.071	.058	1.511	1	.219	1.074	.958	1.203
Attitude(2)	.242	.110	4.815	1	.028	1.274	1.026	1.582
InterPerson			.402	2	.818			
InterPerson(1)	-.032	.056	.322	1	.570	.969	.869	1.080
InterPerson(2)	-.058	.124	.218	1	.641	.944	.741	1.203
MentHealth			4.437	2	.109			
MentHealth(1)	.133	.066	4.003	1	.045	1.142	1.003	1.300
MentHealth(2)	-.024	.124	.038	1	.846	.976	.766	1.244
Academic			.965	2	.617			
Academic(1)	.026	.058	.206	1	.650	1.027	.917	1.149
Academic(2)	.079	.081	.962	1	.327	1.082	.924	1.268
LearnDis(1)	-.012	.071	.030	1	.863	.988	.860	1.135
ParentMentHeal(1)	-.035	.072	.230	1	.631	.966	.839	1.113
ParentSubAb(1)	.010	.065	.023	1	.880	1.010	.889	1.148
SocialSupp			5.317	3	.150			
SocialSupp(1)	.078	.058	1.809	1	.179	1.081	.965	1.212
SocialSupp(2)	.161	.091	3.149	1	.076	1.174	.983	1.403
SocialSupp(3)	-.107	.171	.390	1	.532	.898	.642	1.257
Constant	-4.473	.121	1368.371	1	.000	.011		

Appendix B

THE MISSOURI JUVENILE RISK ASSESSMENT [Revised Cut Score]

JUVENILE NAME _____ JUVENILE ID# _____
JUVENILE DATE OF BIRTH _____/_____/_____ SEX_____M _____F SS#_____-_____-_____
RACE: _____WHITE_____BLACK_____HISPANIC_____ORIENTAL_____AMERICAN INDIAN_____OTHER
PARENT NAME _____ SS#_____-_____-_____

PRESENT OFFENSE CODE (List multiple offenses) _____ _____ _____
DATE REFERRAL RECEIVED _____/_____/_____ DATE FORM COMPLETED _____/_____/_____
COUNTY _____ CIRCUIT _____ JUVENILE OFFICER _____

Age at 1st Referral
16.................................-2
15.................................0
14.................................0
13.................................0
12 and under.....................1

Prior Referrals
None.............................0
One or more......................2
(Actual number of referrals_____)

Assault Referrals
No prior or present referrals
for assault......................0
One or more prior or present
referral for misdemeanor assault..........1
One or more prior or present referrals
for felony assault...............2
(Actual number of referrals_____)

History of Placement
No prior out-of-home placement..........0
Prior out-of-home placement.................1

Peer Relationships
Neutral influence......................0
Negative influence.................1
Strong negative influence........2

History of Child Abuse
No history of child abuse/neglect..........0
History of child abuse/neglect...............1
(Petition filed/DFS finding of
probable cause)

Substance Abuse
No alcohol or drug abuse problem........0
Moderate alcohol and/or drug
abuse problem.......................1
Severe alcohol and/or drug
abuse/dependence...................2

School Attendance/Disciplinary
No or only minor problems..............-1
Moderate problems.................0
Severe problems......................1

Parental Management Style
Effective management style..................0
Moderately ineffective management
style.......................1
Severely ineffective management
style.......................2

Parental History of Incarceration
No prior incarceration..............0
Prior incarceration...................1

RISK SCORE: [   ]

RISK LEVEL:
8 & above = High Risk
2 – 7 = Moderate Risk
-3 – 1 = Low Risk

Motion to dismiss for
certification sustained: [   ]

Check action taken (one):
_____ Informal Adjustment
_____ Formal Process/Adjudication

Check all sanctions you used.
The Matrix recommends sanctions for
a given risk score and offense type.

_____ None

_____ Warned/Counseled
_____ Restitution
_____ Community Service
_____ Court Fees & Assessment
_____ Supervision
_____ Day Treatment
_____ Intensive Supervision
_____ Court Residential Placement
_____ Commitment to DYS
_____ Other: _____

**If you did not use a sanction
recommended by the matrix, check
one of the following reasons why:**

_____ Nature of the offense
_____ Severity of problems associated
with one or more risk factors
_____ Mitigating or aggravating
circumstances
_____ Judicial decision

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THE MISSOURI JUVENILE RISK ASSESSMENT [Re-weighted Items and Revised Cut Scores]

JUVENILE NAME _____ JUVENILE ID# _____
JUVENILE DATE OF BIRTH ____/____/____ SEX ____ M ____ F SS# _____-_____-_____
RACE: ____WHITE ____BLACK ____HISPANIC ____ORIENTAL ____AMERICAN INDIAN ____OTHER
PARENT NAME _____ SS# _____-_____-_____

PRESENT OFFENSE CODE (List multiple offenses) _____ _____
DATE REFERRAL RECEIVED ____/____/____ DATE FORM COMPLETED ____/____/____
COUNTY _____ CIRCUIT _____ JUVENILE OFFICER _____

Age at 1st Referral
16……………………………………-2
15……………………………………0
14……………………………………0
13……………………………………0
12 and under…………………………1

Prior Referrals
None …………………………………0
One or more…………………………3
(Actual number of referrals_____)

Assault Referrals
No prior or present referrals
for assault…………………………0
One or more prior or present
referral for misdemeanor assault………2
One or more prior or present referrals
for felony assault……………………3
(Actual number of referrals_____)

History of Placement
No prior out-of-home placement………0
Prior out-of-home placement …………1

Peer Relationships
Neutral influence……………………0
Negative influence …………………1
Strong negative influence ……………3

History of Child Abuse
No history of child abuse/neglect………0
History of child abuse/neglect…………1
(Petition filed/DFS finding of
probable cause)

Substance Abuse
No alcohol or drug abuse problem………0
Moderate alcohol and/or drug
abuse problem………………………1
Severe alcohol and/or drug
abuse/dependence……………………3

School Attendance/Disciplinary
No or only minor problems…………-1
Moderate problems …………………0
Severe problems ……………………2

Parental Management Style
Effective management style…………0
Moderately ineffective management
style…………………………………1
Severely ineffective management
style…………………………………2

Parental History of Incarceration
No prior incarceration ………………0
Prior incarceration …………………1

RISK SCORE: [   ]

RISK LEVEL:
11 & above = High Risk
3 – 10 = Moderate Risk
-3 – 2 = Low Risk

Motion to dismiss for
certification sustained: [   ]

Check action taken (one):
_____ Informal Adjustment
_____ Formal Process/Adjudication

Check all sanctions you used.
The Matrix recommends sanctions for
a given risk score and offense type.

_____ None

_____ Warned/Counseled
_____ Restitution
_____ Community Service
_____ Court Fees & Assessment
_____ Supervision
_____ Day Treatment
_____ Intensive Supervision
_____ Court Residential Placement
_____ Commitment to DYS
_____ Other: _____

If you did not use a sanction
recommended by the matrix, check
one of the following reasons why:

_____ Nature of the offense
_____ Severity of problems associated
        with one or more risk factors
_____ Mitigating or aggravating
        circumstances
_____ Judicial decision

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THE MISSOURI JUVENILE RISK ASSESSMENT [Re-Developed]

JUVENILE NAME _____ JUVENILE ID# _____
JUVENILE DATE OF BIRTH _____/_____/_____ SEX _____ M _____ F SS# _____-_____-_____
RACE: ____ WHITE ____ BLACK ____ HISPANIC ____ ORIENTAL ____ AMERICAN INDIAN ____ OTHER
PARENT NAME _____ SS# _____-_____-_____

PRESENT OFFENSE CODE (List multiple offenses) _____ _____ _____
DATE REFERRAL RECEIVED _____/_____/_____ DATE FORM COMPLETED _____/_____/_____
COUNTY _____ CIRCUIT _____ JUVENILE OFFICER _____

Prior Referrals
None.. 0
One or more.................................. 4

Assault Referrals
No prior or present referrals
for assault 0
One or more prior or present
referral for misd or felony assault .. 1

History of Placement
No prior out-of-home placement.... 0
Prior out-of-home placement......... 2

Peer Relationships
Neutral influence 0
Negative influence........................ 1
Strong negative influence.............. 3

Substance Abuse
No alcohol or drug abuse problem . 0
Moderate alcohol and/or drug
abuse problem 1
Severe alcohol and/or drug
abuse/dependence......................... 3

School Attendance/Disciplinary
No or only minor
problems................................... 0
Moderate or severe problems......... 1

Parental Management Style
Effective management style........... 0
Ineffective management
style... 1

Parental History of Incarceration
No prior incarceration................... 0
Prior incarceration 1

RISK SCORE: [   ]

RISK LEVEL:
11 & above = High Risk
3 – 10 = Moderate Risk
0 -- 2 = Low Risk

**Motion to dismiss for
certification sustained:** [   ]

Check action taken (one):
_____ Informal Adjustment
_____ Formal Process/Adjudication

**Check all sanctions you used.
The Matrix recommends sanctions
for a given risk score and offense
type.**

_____ None

_____ Warned/Counseled
_____ Restitution
_____ Community Service
_____ Court Fees & Assessment
_____ Supervision
_____ Day Treatment
_____ Intensive Supervision
_____ Court Residential Placement
_____ Commitment to DYS
_____ Other:
_____

**If you did not use a sanction
recommended by the matrix,
check one of the following reasons
why:**

_____ Nature of the offense
_____ Severity of problems
associated
_____ with one or more risk factors
_____ Mitigating or aggravating
circumstances
_____ Judicial decision

2-3